National Aeronautics and Space Administration

Lyndon B. Johnson Space Center

roundup

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It's so easy being green

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JSCdirector

A few safety-related events have been on my mind recently, and I need your help!

First of all, I want to emphasize there is *nothing* we do in our space program that would require us to take safety shortcuts or unnecessary risks. Spaceflight is inherently risky, including the development and testing of state-of-the-art materials and designs. To be perfectly safe, we would never leave the ground, but that is not the business we chose and it is not the mission our nation gave us. But we should not and *cannot* add unnecessary risks. None of us should ever feel pressured to do anything we deem unsafe in order to meet a schedule. We have learned to launch when we are ready and *not before*, and I'm impressed with the number of times we have delayed launches because of reasonable concerns expressed by individuals. My point is: don't let anyone pressure you into doing something that you consider unsafe. I will back you up.

Second, I am concerned that there is reluctance on the part of some folks to report safety incidents such as minor injuries or mishaps or close calls. Their fear is that such reports will affect our safety metrics, such as lost time, days away, Occupational Safety and Health Administration recordable, etc. Let me state very clearly and forcefully that the *sole* goal of our safety program is to make our work environment as safe as possible for all our employees. The metrics are meant to be a *tool* to help us recognize positive and negative trends and to help us benchmark against other similar organizations. The metrics are *not* the goal, but rather a source of data for us to manage by. It allows us to assess the risks within the center and develop strategies on how to mitigate or eliminate them. But to be the least bit useful, the metrics must reflect accurate data, and it is up to each of us to provide that accurate data. If any one of us has a minor injury or close call, or if we observe something potentially hazardous, our first thought should be to report the incident so that a coworker doesn't get hurt in a similar situation. I honestly don't care if we meet any specific safety metric goals. But I care very much if we are making all Johnson Space Center facilities as safe as possible. It's entirely feasible that we can be unsafe and have terrific safety metrics. I would much prefer to have a safe environment as well as valid, useful metrics to help us identify positive or adverse trends. In fact, if we value safety and truly learn from incidents and mishaps, the numbers will take care of themselves.

So, again, I need your help. I need each and every employee at all of our JSC facilities to feel as personally responsible as I do about reporting all incidents, close calls and observed safety hazards. We have been working for more than a year on ensuring we incentivize the behavior we desire. While safety metrics are one measure of success, safe performance is much more than that. Leadership prevention efforts and the reactions associated with safety are significant elements considered in successful safety performance. If *anyone* feels any reluctance to report incidents which we could all learn from, then we have the wrong "culture." Help me change it. Suggestions would be greatly appreciated.

On the cover

With Rocket Park visible in the background, a tiny portion of Johnson Space Center s deer population looks ahead.

Spotlight on...
Joseph J. Kosmo

Senior project engineer of Advanced EVA Systems Development

How long have you been with NASA? It's going on 47 years. I started working for the original Space Task Group in Langley, Va., on Nov. 21, 1961. That was just before we moved to Texas and became the Manned Space Craft Center (now Johnson Space Center).

What kind of hobbies or interesting things do you do away from the office? I have a variety of eclectic interests ranging from collecting artwork to flying in old World War II aircraft. I also have been doing some wildlife management activities on my hunting ranch.

What is your favorite food? Oh, I enjoy all types of food—Italian, Mexican, Chinese, Indian. But since you asked, one thing that I rarely can get is good ol' spare ribs, sauerkraut and mashed potatoes (with gravy)! Now that's a real treat—if not heart-stopping!

What is your favorite sport? I get a kick out of seeing my 11-year-old grandson Nils playing baseball and football.

What is your favorite CD/music artist? I like classic music, old 1950s to 1960s rock & roll, rockabilly and old country blues music. I like artists you've probably never heard of, such as Big Bill Broonzy, Huddie Leadbetter, Mance Lipscomb, Lonnie Johnson and Jesse Fuller.

What is the last good book or article you read? Gosh, I recently finished reading a couple of good books: "Prospects for Interstellar Travel" by John Mauldin; "Theodore Roosevelt Letters and Speeches;" and "Strange Angel" by George Pendle, a biography and character study of a very interesting maverick rocket scientist named John Parsons from Caltech who was one of the founders of the Jet Propulsion Laboratory.

What is your idea of a perfect vacation? Either an October trip to my lake house in Pennsylvania to see the wonderful fall foliage or a quick trip to visit my hunting ranch near Rocksprings in west Texas to experience nature in a rough and relatively unspoiled condition.

What is the best movie in your collection? The western movie "Open Range" with Robert Duvall.

What is the coolest part of your job? I guess coming to work every day and probably not having to do the same dull routine is the neatest part of my job, but the "coolest" part is being able to work on new projects with some of the smartest folks I know.

What does JSC mean to you? It represents a highly successful "family" to me. I'm truly proud of having seen it grow from, basically, a core handful of people who relocated from Virginia to Texas to develop fundamental space facilities on a remote (at that time) prairie outside of Houston, to placing humans on the moon. And, all the other subsequent space achievements that JSC has accomplished since I joined NASA are truly impressive. I'm sure anyone would be proud of these "family" accomplishments and glad to have been able to participate in their development.

What do you look forward to at NASA? Looking forward to getting back to the moon and then on to Mars!

What is your best memory at JSC? I've had so many good memories, but perhaps the best memory is when I had the distinct opportunity to demonstrate the prototype Apollo spacesuit for President Kennedy when he visited JSC in September 1962.

What is your favorite quote? An old Russian proverb—"Trust but verify."

Snapshot of the MK III advanced demonstration spacesuit and Extravehicular Robotic Assistant vehicle interactive field tests. Test Director Joe Kosmo stands by Dr. Dean Eppler, who is wearing the MK III suit.

What would people be surprised to know about you? I'm not sure what would surprise people nowadays, but once I had the unique opportunity to actually participate in an FBI raid to recover and identify stolen government space artifacts.

What is a quality you most admire in people? Honesty and integrity.

Who are your heroes? It probably seems corny now, but when I was a kid growing up before TV and mass media as we know it today, my heroes were the old Saturday matinee cowboys like Tim McCoy, Gene Autry, Ken Manyard, Hopalong Cassidy, etc. They offered a clear line of distinction between good and bad and they were associated with bravery and pioneer spirit as they helped make a better life. I guess those qualities and code of conduct are still relevant and needed today.

Do you know a fellow JSC team member who does something interesting or noteworthy outside of work, in addition to their day job? Would you like to nominate someone to be highlighted in the Roundup Spotlight page? Send your suggestion to the JSC Roundup Office mailbox at jsc roundup@mail.nasa.gov with the person s name, work title and a brief description of why he or she should be considered.

Johnson Space Center: a lean, green sustaining machine

By Catherine E. Ragin

NASA

When it comes to celebrating our uniquely precious globe this Earth Day, there is no better candidate than Johnson Space Center. The home for human spaceflight knows a thing or two about not only exploring the cosmos, but also appreciating our own special environment on the ground and at our center.

"(This is) the way I see human space exploration," said STS-120 Commander Pam Melroy. "I think that we need to expand outward into our universe so that we can get a better perspective on our own Earth, what our role as humans who live on this Earth really is and what our place in the universe is."

While much of our greening efforts may be under the radar to most JSC team members, the center is doing plenty to ensure that we respect the energy resources our planet has to offer and the delicate ecosystem we are situated on.

NASA/BLAIR JSC2008E020451

NASA/HARNETT JSC2008E020461

Wildlife flourish in the carefully preserved ecosystem on site.

"It's about doing things the right way and not just doing cutting-edge stuff because it's cool," said Joel Walker, the director of Center Operations. "NASA has recognized that doing it cheaply upfront is not necessarily a smart thing to do. Some of the things we are doing are very codified, with specific requirements and specifications. Other things are more philosophical and represent an attitude or commitment."

The commitment is evident in the sheer numbers and types of greening initiatives underway, from the changes in the buildings being retrofitted or newly built, to nurturing sustainable native Texas landscapes on site. Walker is enthusiastic about our efforts and how they will invigorate our center's future.

"I believe you will see a much more natural landscape than we have today as we move away from changing the environment to accommodate us, to working within the environment given. I think employees will find the workscape much more flexible and mobile. There will be less 'private' space and more 'public' space," Walker said. "In addition, as our surrounding communities grow, our place as a sanctuary for some wildlife and native Texas prairie will become even more special than it is today."

As for the most obvious changes on site, the plans to refurbish existing buildings to new green standards and build new office space will give JSC a futuristic but environmentally friendly appearance.

"For the refurbishments (for buildings such as 2 North), we will take a building that we've used and grown accustomed to for 40 years and totally change its character and feel," Walker said. "The new interior office workspace will be the most dramatic change, and I think folks will be amazed when they see it. I also think it will lead to a more productive, healthier and happier workforce. It should really give employees an immediate boost in morale."

A few of the solar arrays powering the environmentally updated JSC Child Care Center.

NASA/BLAIR JSC2007E049863

NASA/GEESEMAN JSC2007E101500

The kids at the JSC Child Care Center get a fun lesson in solar energy with a solar-powered bubble-maker.

Not to mention, it will boost energy efficiency for the center.

JSC team members also have an important role to play in the continued success of our greening initiatives. Many of the programs depend on our participation, such as recycling.

"It's very important, and every little bit helps. I also hope that we can contribute to getting employees to think about environmentalism in a different way," Walker said. "Personally, it's been my involvement at work that has spurred changes in my home life."

One quote that has been instrumental in changing Walker's mindset is, "You don't throw things away. There is no away."

"I feel a whole lot better when I look at all of the materials that we are ripping out of Building 2 North and placing in segregated dumpsters so it can all be recycled," Walker said.

Other noteworthy projects for the center include initiatives in the production, purchase, operation and distribution of utilities.

"Our recent work in retrofitting a steam boiler with an ultra-low emissions system and purchasing a new boiler with similar low-emission standards has greatly reduced our air emissions on site," Walker said. "We are looking at what kind of system we would like to have as backup power in Building 48, to replace those huge diesel engines that we bought used from another government agency many years ago. Those kinds of changes are costly but will have remarkable impacts on our energy use and emissions profile."

Environmentalism is more than just a coined phrase. It is a new way of thinking and progressivism.

"Whenever you are in a position to see things from a new perspective or in a new way, I think that is something that lifts everyone's heart," Melroy said.

NASA/GEESEMAN JSC2007E101493

The children at the child care center show their appreciation for their "green" facility with a "green" poster.

There are necessary steps to care for our "blue marble." Right now, it is the only place that can sustain us, so we must do everything in our power to sustain it.

"We are in a target-rich environment, as they say. Look around, take stock of what is going on in your work area, your program, your directorate," Walker said. "We can't necessarily change everything at once, but we can make strides and move in the right direction. It's not 'all or none.'"

JSC GREEN INITIATIVES

Sustainable Buildings

Efforts are underway to redo or build new structures in accordance with Leadership in Energy and Environmental Design (LEED) practices. LEED green ratings are assigned for practices such as: sustainable site planning; safeguarding water; water efficiency; energy efficiency and use of renewable energy; conservation of materials and resources; and indoor air quality. As mandated by the federal government, Johnson Space Center must earn at least 26 LEED credits and meet seven minimum standards.

Certified as LEED Silver:

- Building 27: The Astronaut Quarantine Facility.

Designed to LEED Silver (minimum):

- Building 207A: Gilruth Recreation Center facility addition (under construction).
- Building 29: Constellation Avionics Integration Laboratory (in design, retrofit).
- Building 12: Offices (in preliminary scoping phase, retrofit).
- Building 26: The Center for Human Space Flight Performance and Research (in preliminary scoping phase/retrofit).

Designed to LEED Gold:

- Building 2 North: Office of Communications and Public Affairs (under construction, retrofit).
- Building 20: New office building (under construction).
- Building 265: Source Evaluation Board office additions (under construction).

Renewable Energy/Energy Conservation

- Redesigned JSC Child Care Center as a multi-platform renewable energy system. Installed wind and solar power generators, programmable thermostats and other power-saving techniques. Estimated to generate more than 62,000 kWh of energy.
- Installed solar panels to generate power for Emergency Warning System and crosswalk lights.
- Installed 11 solar-powered lights in 300-area parking lots.
- Replacing approximately 350 parking lot lights with high-efficiency fixtures.
- Provided, through a partnership between Environmental Office and the EVA Office, a solar recharge station to recharge electric tools and equipment used during field tests (replaced a gasoline generator).
- Purchased renewable energy credits that equal 8.8 percent of the site's electrical use in Fiscal Year 2007.
- Completed CenterPoint Energy retro-commissioning activity, which identified energy saving opportunities at Building 24.
- Planning for an energy audit in several facilities and to establish an energy awareness program for the site.
- Planning a CenterPoint Energy audit of compressed air system.
- Initiating a water study for JSC.
- JSC energy manager planning to participate as a team member of the City of Houston's proposed Solar Houston Advisory Council.

Natural Resources

- Conservation landscape at Building 30: One of NASA's first native landscapes educates employees on native plants (which use less water, fertilizers and pesticides) and on water pollution runoff issues from lawns and landscapes.
- Attwater's Prairie Chicken Captive Breeding Program: JSC partnered with the Houston Zoo to provide space for breeding pens for this seriously endangered bird. The previous location at the Houston Zoo was being encroached upon and was not optimal for the birds.
- Sustainable landscapes: JSC partnered with the Lady Bird Johnson Wildflower Center to create sustainable native landscapes. This project is a test site for a new program developed by the Wildflower Center and the American Association of Landscape Architects, called "Sustainable Landscapes." The project evaluates landscape design and maintenance programs and rates them in terms of long-term sustainability (similar to LEED rating system for buildings). JSC will be one of the world's first landscapes designed for this program.

Recycling and Pollution Prevention

- Installed a photo lab zero-discharge system that takes the photographic chemicals and wash-water used in the lab and turns it back into high-quality make-up water to be reused in the film-processing machines.
- Currently recycling paper (730,600 pounds), cardboard (229,060 pounds), aluminum (18,220 pounds), concrete (2,172,350 pounds), construction and demolition material (634,420 pounds), asphalt (9,497,730 pounds), soil/sand (844,720 pounds), scrap metal (1,722,545 pounds), lead-acid and NiCad batteries (37,561 pounds), mercury fluorescent lamps (14,800 pounds), jet fuel (79,857 pounds), pallets (3,088,500 pounds), aluminum cans and others for a total of 19,211,280 pounds in 2007.
- Initiated a grassroots plastic bottle recycling program which volunteer employees put out containers and take the bottles to local recycling centers (1,013 pounds in 2007). New custodial contract initiates a plastic recycling program in the first year of the contract.
- Purchases items made from recycled products, including paper, sanitary tissue products, packaging, binders, office furniture, desk accessories, trash bags, toner cartridges, carpet, paint, floor tiles, drums, signs and more. In 2007, approximately 73 percent of purchases contained recycled content ($2,834,719 out of a total of $3,874,533).
- Equipped two boilers in Building 24 with ultra-low NOx burners that achieve 90 percent reduction of emissions.
- Installed a 1,000-gallon Ethanol 85 fueling facility that supports about 50 government flex-fuel vehicles.
- Retired 1,100 portable Halon 1211 fire extinguishers and replaced them with dry chemical or carbon dioxide; retrofitted two centrifugal chillers at Building 48 with ozone-friendly refrigerant.

Read 'Round the World inspires learning

By Catherine E. Ragin

NASA/BLAIR JSC2008E025879

Education Specialist Erin McKinley and Astronaut Nicole Stott reached out to thousands of students during the Read 'Round the World live broadcasts.

When people think of NASA, they normally think of subjects such as science, technology, engineering and math. However, the skill of reading is the basis for everything we accomplish in the space program. And, as the agency also strives to do, reading can transport you into new worlds that you otherwise would never have known.

On March 3, Johnson Space Center's Digital Learning Network (DLN) celebrated the joys of reading with a special event, appropriately dubbed Read 'Round the World, in honor of Dr. Seuss' birthday. With the wonders of live videoconferencing, Read 'Round the World connected Education Specialist Erin McKinley and astronaut Dr. Nicole Stott with approximately 5,000 young students throughout the United States. The majority of the audience consisted of kindergarten through eighth-grade students. The event was also available as a live Web cast, allowing even more children access to the one-of-a-kind celebration.

"Read 'Round the World was a special event, meaning that it was a unique, one-time program designed around a specific focus," McKinley said. "The event came from numerous requests from teachers asking if we had any programs in connection with such topics."

The program focused on the many uses of reading. Read 'Round the World strove to explain how reading skills are used outside of the classroom and in a technical field, such as for NASA missions; identified examples of how astronauts use reading skills for training and missions; compared and contrasted how communications methods have changed throughout NASA's 50 years of existence; emphasized the importance of reading both on Earth and in space; and motivated students to use reading as a tool in their future careers and how, someday, they could even work for NASA.

"As a former classroom teacher, I understand the importance of connecting important skills, such as reading, to real-world examples, and bridging skills to other content areas such as math and science. I certainly hope our event would have put a smile on the face of Dr. Seuss," McKinley said.

Stott, who has been with the Astronaut Office since 2000, added her unique insight for the kids participating around the country.

"I've wanted to work for NASA since I was a kid and watched the moon landing," Stott said.

And even though her career is centered on more technical topics, none of it would be possible without reading.

"We not only have to be able to read from the manual, but there's even a little checklist on my arm," Stott said, pointing out a picture of her in a training session for the International Space Station.

Stott treated the students by reading out of her 5-year-old son's favorite children's book, Dr. Seuss' "I Can Read With My Eyes Shut!" Upon finishing the book, she admitted that her personal Dr. Seuss favorite was "The Cat in the Hat," "just because of the mischief that goes on in that book," she said.

In addition to reading, Stott discussed how learning languages early on enhances reading and comprehension skills.

"I have been learning Russian for the last five years, and it has been an amazing experience. I would suggest for all of you, the earlier and more languages you can learn, the better."

In the real world, to many kids' dismay, learning never ends. That is especially true at NASA and for the astronauts.

"I would try to tell everyone to pay attention to what you enjoy… The whole astronaut training program is a lot like going back to school. The tests never end," Stott said.

And neither does the reading. Stott said that when she goes on her stint to the International Space Station, she will have at her disposal an existing library of books already on the station. In addition, psychological support personnel will send up other reading material for her to view via the Internet. It will be reading on a computer, but it means that Stott will not have to miss out on reading some of her favorite magazines such as "Air and Space."

Two books the astronaut highly recommends for adults are "West with the Night" by Beryl Markham, and "The Man Who Sold the Moon" by Robert A. Heinlein.

Read 'Round the World stressed not only the functionality of reading in everyday life, but also the pleasure to be gained from burying oneself in a good story. The program allowed students to understand how reading could even improve their skills in areas they had not previously considered.

"Reading is an important component of everyone's education. NASA wants to address not only STEM (science, technology, engineering and math), but across the curriculum, incorporating language arts skills, like reading," said Michelle Leggett, supervisor of the DLN. "It is a skill everyone uses in their daily lives, and it is important to tie all studies together for students in order to create a more well-educated and well-rounded society for our future."

The next 20 years...

Advanced Planning Office looks beyond the moon

Artist's renderings of futuristic concepts.

By Heather Nicholson

Will the next giant leap for mankind be a dusty, red walk on Mars? It's possible. The Advanced Planning Office, created three years ago, is already looking at NASA's goals 20 years from now … and they are out of this world.

"This is the best kept secret (at) the center," said Steven Gonzalez, deputy of the Advanced Planning Office at Johnson Space Center. "We've been around for three years, and it's the center director's desire to focus on advanced planning for the next 20 years."

In establishing the Advanced Planning Office, their goals were clear: develop JSC's long-range plan, track key technology advances and strengthen partnerships with other NASA centers.

"For the most part, we followed that direction," Gonzalez said.

JSC will continue to lead the human presence in space by flying the shuttle safely, completing International Space Station construction, developing the Orion, providing support for commercial crew and cargo space vehicle development and returning to the moon.

Beyond that, some exciting ventures, such as commercial tourism in Earth's lower orbit and human exploration to Mars, are closer to realization than one might think. In 20 years, the Advanced Planning Office believes this kind of travel will significantly increase with the merger of other countries, our government and private entities.

"What an exciting time to work at JSC. We have an opportunity to shape human spaceflight. That's an awesome responsibility. A large part of our challenge will be learning to change swiftly. How can we leverage state-of-the-art technology when our formulation, design, build and test cycles span decades? The answer to this question is key to establishing a long-term human presence in the solar system," said Sandra Wagner, Lunar Regolith Management Strategy lead.

Wagner and several other JSC team members are expressing their own vision for JSC's advanced planning in an online blog at http://af.jsc.nasa.gov/. The Advanced Planning Office outlined several of their ventures and opened them up for discussion to those who will eventually lead these projects.

Garret Fitzpatrick, a new JSC team member, wonders how JSC will connect the new generation of engineers and mission specialists with NASA's goals.

The future of JSC

NASA/BLAIR JSC2006E02769

In 2005, JSC Director Mike Coats established the Advanced Planning Office at JSC. This office serves as the primary center interface to the Headquarters Program Analysis and Evaluation Office. The Advanced Planning Office is responsible for developing the center s long range plan, as well as tracking the center s key technology activities and strengthening external partnerships.

NASA

Planning JSC s future will take input and ideas from everyone here. The Advanced Planning Office started an open discussion, online blog outlining ideas for the future of human space exploration. Find the blog at http://af.jsc.nasa.gov/.

NASA JSC2006E21849

What will JSC look like in 2025? What will the international human spaceflight environment be like? These are a few of the questions that the Advanced Planning Office and the JSC Senior Leadership Team have been wrestling with as they consider what it takes to make human exploration on Mars come to life.

NASA S95 01406

Forget Hawaii let s go to space this summer. It s not as farfetched as it sounds, considering that serious talks about low orbit spaceflights for the average consumer have been in progress for some time. Much like the commercial airline industry was spurred by the government s use of cargo planes, the Advanced Planning Office is exploring the space tourism market.

"Wow, 17 years seems like an eternity to me. As a new employee here at JSC, it's hard to imagine what things will be like in two years, let alone 17. How do you make sure your Generation Y community of employees stays connected to those long-term goals of human spaceflight?" Fitzpatrick said.

By 2025, JSC will focus all of its resources and talent on human exploration missions beyond low-Earth orbit. Its goal is to be recognized as the integrator of human space exploration through its ability to conduct design, development, integration, test and verification; operations and integration; life sciences; and astronaut selection and training.

Some highlights of the Advanced Planning Office in the past three years include:

- Performing External and Internal Assessments of JSC to find out the perceptions of JSC's strengths, weaknesses, reputation and perceived ability to lead the international team on the Human Exploration of Mars.
- Assessing Strengths, Weaknesses, Opportunities and Threats (SWOT Analysis) with the JSC deputy directors.
- Conducting an environmental scan of the trends in commercial, military and international space.
- Conducting an environmental scan of trends in education, role of government and technologies.
- Performing scenario planning on the various possible futures for JSC.
- Developing a JSC Blueprint.
- Providing two JSC senior staff retreats aimed at focusing on JSC's long-range future.
- Setting a benchmark on strategy execution with the leading companies and organizations in the high-technology sector, government organization and space sector.
- Creating a Technology Integrated Product Team to focus the internal research and development investments and grouping the technology investments into Focused Investment Groups.
- Merging the Technology Transfer Office into the Advanced Planning Office, collaborating on a benchmarking effort with Space and Life Sciences on Strategic Alliances.
- Initiating an internal blog on JSC's long-range strategy.
- Planning to sponsor an offsite meeting to gather the Generation Y's perspective on the strategic direction of the center, since they will be the ones to inherit the center.
- Co-leading the inter-center forums among the Advanced Planning Offices across the agency.

Packs like a tent, acts like a building

JSC engineers test inflatable habitat in Antarctica for future lunar living

By Heather Nicholson

When NASA astronauts start exploring the moon again in 2020, they might find their lunar stay more like a camping trip. Of course, there won't be any campfire sing-alongs or roasted marshmallows, but an inflatable tent may serve as their living quarters.

To test this idea, Johnson Space Center engineers partnered with the National Science Foundation and ILC Dover. A group of eight went to Antarctica in January to demonstrate and deploy a conceptual inflatable technology for lunar habitation.

NASA\TOUPS JSC2008E006033

The habitat starts out as two small packs and becomes 16 feet wide by 24 feet long, weighing 950 pounds. Tents that are currently being used are roughly the same size, but weigh more than 2,000 pounds. It took 50 minutes for four people to set up Habitat.

The "inflatable habitat" is a 384-square-foot tent with an entryway tunnel outfitted with various thermal and pressure sensors, Web cams, a carbon dioxide monitor, heaters, light-intensity meters, power monitors and a localized weather station. All data and images collected are transmitted to a JSC control station via Internet connection.

The JSC team is hoping the external Web cam that is monitoring Habitat will soon be accessible to school classrooms and the general public. Even though six months of darkness has descended on Antarctica for its winter season, the Web cam is equipped with night vision.

"We haven't tested it fully yet, but we may be able to pick up reflections off Habitat," said Todd Hong, who is with JSC instrumentation.

NASA\TOUPS JSC2008E014843

The inflatable habitat is a 384-square-foot tent with an entryway tunnel outfitted with various thermal and pressure sensors, Web cams, a CO_2 monitor, heaters, light intensity meters, power monitors and a localized weather station.

Hong said that when feeds do become available to the public, the habitat will be able to be viewed live with a small delay in time.

"We have access to it now through our lab. It will (be available to the public)—it's just a matter of when," Hong said.

Comforts of home

After an extensive check of equipment and cold-weather gear, the habitat team left New Zealand for McMurdo Station, the main hub of Antarctica research.

The team consisted of NASA engineers **Larry Toups**, JSC Constellation Program Lunar Surface System Project Office; **Gerard Valle**, JSC Habitat project manager; **Scott Hafermalz**, JSC instrumentation; and **Todd Hong**, JSC instrumentation. The ILC Dover engineers are **David Cadogan**, ILC Dover director of Research and Development; **Craig Scheir**, ILC Dover lead electrical engineer; National Science Foundation, Raytheon Polar Services (RPSC), **Jeff Cole**, RPSC project manager; and **Michael Delaney**, RPSC.

Unlike the comfortable commercial flight from Houston to New Zealand, the habitat team was transported to the icy continent by an Air Force cargo plane with no windows. Toups said that not being able to see the plane's descent was a little unnerving, especially since Antarctica's main landing strip is a massive ice glacier.

The group was then driven by a red bus with large snow tires (affectionately called Ivan the Terra bus) to McMurdo Station, a scientific compound where nearly 1,000 scientists from around the world live during the summer months.

"It was kind of bizarre," Toups said. "I would compare the place to a basic mining camp. It was very basic, not a country club."

For 10 days the habitat team lived in 20-degree weather with about six to 12 inches of snow falling every 24 hours. Winds would peak at 100 mph, and arctic wildlife such as penguins and seals would openly waddle up to their human visitors.

"The people who live there (McMurdo Station) are very sensitive about the environment, and they recycle everything," Toups said.

Ready for research

Last year, more than 40 proposals were submitted by JSC teams for a research grant. It was the Constellation Program Lunar Surface Systems Office that won the competition for Habitat's research, partnering with the National Science Foundation and ILC Dover.

The objective was simple: design, construct and test an inflatable structure that would be light to transport, easy to deploy and could survive harsh weather conditions.

"This will not be the exact structure we would use on the moon," Toups said. "The data collection will be something we'll learn from and incorporate into our future habitat."

Toups and his team have been receiving data from the habitat for about four months, but as Antarctica's winter approaches, the durability of the habitat will truly be tested.

Habitat is already a superior option for living in Antarctica, Toups said. Even if that exact design isn't taken to the moon, the National Science Foundation could use it for their research at McMurdo Station.

The habitat is 16 feet wide by 24 feet long, and weighs 950 pounds. Tents that are currently being used are roughly the same size, but weigh more than 2,000 pounds. Toups said it took 50 minutes for four people to set up Habitat. Their motto for the structure is, "packs like a tent, acts like a building."

Habitat will remain at McMurdo Station for one year while data continues to transmit back to JSC for analysis. Later this year, NASA and the National Science Foundation plan on hosting a nationwide naming contest for school children to name the habitat.

"We are still working on developing this agreement; it is being reviewed by the National Science Foundation. Once the government is in sync, I've got to loop in the private entity involved," said Jack Yadvish, deputy director of the Innovative Partnership Program Office.

Living in Habitat

For most of the stay, the habitat team lived in dorm-like rooms already established at McMurdo Station. But no computer data could compare to the men actually living in Habitat, so they spent the night inside the tent.

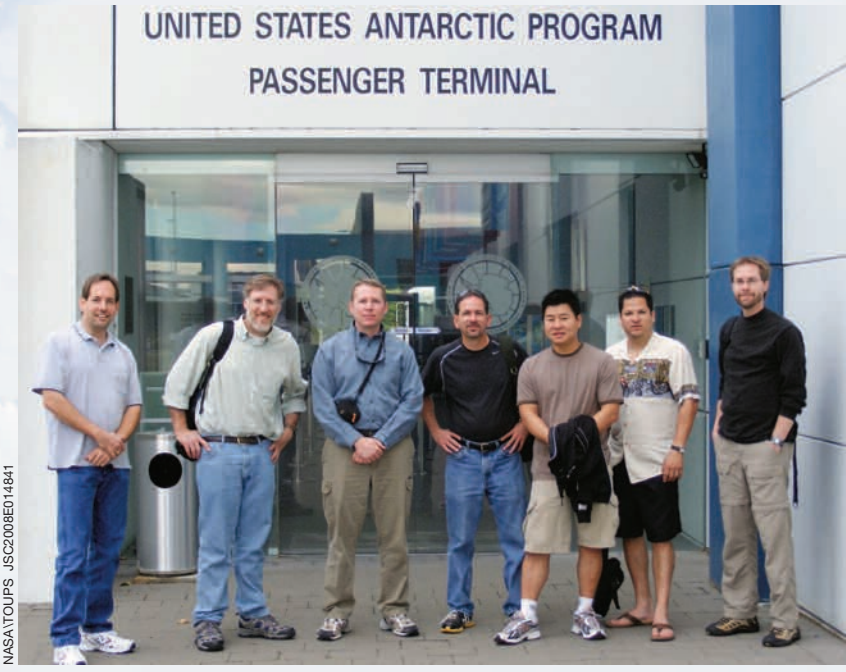
"It was very much like a camping trip," Toups said. "We didn't just design the external, but what the internal would look like, too."

The team outfitted the floors with lightweight, interlocking foam that looks like something you would see on a children's playground. It took one day to wire the tent for Internet access, with several terminals operating at high speeds. Toups said the team called it their "Internet Café."

Toups even wrote a daily blog of their stay, which can be found at: http://www.nasa.gov/mission_pages/constellation/main/inflatable_habitat_blog.html.

Huddled together in sleeping bags, the habitat team spent the night in Antarctica's outdoors watching I-Robot on a laptop. Toups said the overnight research was a success, and Habitat was very livable.

About 100 scientists from other teams were invited to tour Habitat. Toups said he made several presentations throughout the day and received a lot of positive feedback from people who regularly live at McMurdo Station.



NASA\TOUPS_JSC2008E014841

The team who visited Antarctica to test an inflatable habitat included, from left, Scott Hafermalz, NASA-JSC instrumentation; Craig Scheir, ILC Dover lead electrical engineer; Jeff Cole, National Science Foundation (Raytheon Polar Services) project manager; Larry Toups, NASA-JSC Constellation Program Lunar Surface System Project Office; Todd Hong, NASA-JSC instrumentation; Gerard Valle, NASA-JSC Habitat project manager; and David Cadogan, ILC Dover director of research and development.

NASA/HARNETT JSC2008E017958

The Texas Independence Trail Ride *made its way through Johnson Space Center on Feb. 26. The horse-drawn chuck wagons, mules and riders spent the night at the Gilruth Center before heading out to Houston. Rabbits were brought to the Child Care Center and a good ol'-fashioned dance at Starport Café in Building 3 added to the rodeo fun.*

JSC also had a NASA booth at Rodeo Houston, which attracted space and rodeo fans alike. The exhibit was on display from March 3 to 22.

A glimpse of our Wild West past amidst the rockets… The Texas Independence Trail Ride moseyed on through Johnson Space Center on Feb. 26.

NASA/BLAIR JSC2008E025014

A young NASA enthusiast tries his hand at an interactive exhibit at the NASA booth at Rodeo Houston.

NASA/BLAIR JSC2008E025022

Astronaut James Dutton signs an autograph at Rodeo Houston.

Space Center Roundup

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